

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
PRESCRIBED BURNING
 (Acres)
CODE 338

DEFINITION

Applying controlled fire to a predetermined area.

PURPOSES

Prescribed burning will be applied as part of a conservation system to support one or more of the following purposes:

- Maintain or restore desired plant community.
- Improve forage quality and/or quantity.
- Improve or manipulate grazing or browsing distribution.
- Reduce excess plant litter.
- Reduce wildfire hazards
- Enhance seed and seedling production.
- Suppress woody plant invasion.
- Improve wildlife habitat.
- Prepare sites for planting or seeding
- Control plant diseases
- Enhance wetland diversity
- Restore and/or maintain savannah or oak/hickory communities

CONDITIONS WHERE PRACTICE APPLIES

Conservation practice 338 can be applicable on rangeland, forestland, native pasture, pastureland, native hay meadows, wildlife areas, and areas retired from agricultural purposes.

GENERAL CRITERIA

Cooperators will be cautioned to burn in accordance with applicable federal, state, and local laws and regulations. They must understand that they may be liable for damages caused by fire escaping from their land or for damage caused to others from inadequate smoke management. They may also be responsible for fire suppression cost, should the fire escape the designated area.

Liability and safety precautions are to be planned before the burn and monitored during the burn.

The procedure, equipment, and the number of trained personnel shall be adequate to accomplish the intended purpose. The timing of the burn will be based on, as a minimum: relative humidity, temperature, wind conditions, cloud cover, time of day, fuel conditions, and best time to achieve purpose(s).

Criteria applicable to development of site specific specifications for all purposes set forth above:

The fire prescription will be determined using the table entitled "ACCEPTABLE CONDITIONS FOR PRESCRIBED BURNS" in Section V., Conditions for Day of Burn, in Illinois Job Sheet 338 (IL-JS-338), Prescribed Burn Plan. Relative humidity, wind speed, cloud cover, and time of day are accounted for in the table. Winds must be relatively steady in velocity and direction. If winds are gusty and/or shifting more than 45 degrees from the prevailing direction, conditions are out of prescription regardless of other factors.

Fuel load will be at least 1200 pounds per acre of fine fuel (dry grass and litter) with at least 50% standing. Fuel conditions will be documented in Section I., Description of Burn Area, in IL-JS-338.

Soil moisture will be sufficient to ensure protection of root crowns and ensure plant

regrowth following burning. Soil moisture will be moist to wet to the touch.

Soil limitations and restrictions will be based on Section 430-VI, Part 620-104, Prescribed Burning, of the National Soil Survey Handbook, November 1993 (see Table 1). Affects of prescribed burning on the vegetation are influenced by the soil. Therefore, soil properties and qualities to considered are slope, soil texture, drainage class, depth to a restrictive layer, and the presence and thickness of an O horizon.

Table 1 lists the properties and qualities of soils, their limits, and their restrictive features. Soils rated SLIGHT have few limitations that affect the reestablishment of vegetation. Soils that have MODERATE limitations require post-burning practices to achieve the desired results. Soils that have SEVERE limitations require post-burning practices to achieve the desired erosion control.

Firebreaks will be utilized to contain the area to be burned. Mechanical, chemical, wetline, burned, natural, or structural firebreaks will be used alone or in combination to contain the burn. Refer to Firebreak Standard (394) for design specifications for firebreaks.

Weather conditions will be observed in advance of planned burning dates. Fire crews and equipment need to be on standby status to take advantage of favorable burning conditions.

Weather fronts - do not burn within 12 hours of a passing weather front.

Weather service will be contacted for 24-hour weather forecast prior to burn. Monitor on-site weather conditions immediately before and during burn. **Burning will be postponed**, if weather conditions are, or are expected to fall, outside of the Prescribed Burn Plan prescription.

Wind direction; burns should be planned, where possible, so winds will carry smoke away from major roads or highways, airports, or occupied residences. When burning within 1 mile of an airport, secure necessary permission from airport authorities.

Temperature inversions result in unacceptable burning conditions that prevent smoke from rising vertically, causing smoke to remain in the lower atmosphere.

Electrical or high power transmission lines will be documented and the burn plan designed and applied so that large fire fronts or high, dense smoke columns will not cross under or contact these lines. Electrical discharge can occur due to high concentrations of carbon particles suspended in smoke columns. Particular care must be given when burning around wooden utility poles.

Residential or populated areas will be avoided, do not burn within 1 mile of these areas without adequate notification.

Access to the burn area by unauthorized personnel will be restricted.

Burning will occur during daylight hours only. Time mop up operations so that they will be completed before sunset.

ADDITIONAL CRITERIA

Criteria to maintain or restore desired plant community; or to improve forage quantity and/or quality:

Frequency of burning should not be more than once every three years, to stimulate vigor and production of warm-season grasses or to maintain diversity of mixed grass communities.

Specify on the burn plan desired species to be maintained or restored. Time of burning should be just prior to or soon after dormancy break of desired species in the spring.

Generally, grass species are burned in spring when the desired grass has achieved 1-3" of new growth, usually from late February to late March for cool-season species and from early April to early May for warm-season species.

Burning in spring and fall of the same year will greatly reduce stands of cool-season grasses, including tall fescue.

Criteria to improve or manipulate grazing distribution:

Frequency of burning will be based on extent and duration of grazing responses, but should not be more than once every three years.

Grazing areas and desired species should be adjusted in relation to grazing pressure.

Time of burning should be just prior to or soon after dormancy break of desired species in the spring.

Criteria to reduce excess plant litter:

Burning for maintenance of ungrazed wildlife areas or grass stands under long-term retirement programs, should be carried out once every three to four years, depending upon amount of litter accumulation and vigor of stand.

Criteria to suppress woody plant invasion:

Specify applicable target species to be suppressed and potential of fire damage to non-target species on IL-JS-338, Sect. II Purposes for Conducting a Prescribed Burn.

Time of burning to suppress deciduous species should be in late spring, when the target species have just fully leafed and carbohydrate reserves are at their lowest, or in late fall. Coniferous species, such as cedar, should be burned after the herbaceous species to be improved starts growth. The best suppression on coniferous species is achieved when they are small, from one to three feet tall. Larger trees will need to be cut prior to burn for best control.

Frequency of burning should be based on regrowth of target species, weighed against forage and/or wildlife habitat considerations.

Criteria to improve wildlife habitat or to enhance wetland diversity:

Specify wildlife-preferred species to be improved or enhanced and potential of fire damage to other desirable species on IL-JS-338, Sect. II Purposes for Conducting a Prescribed Burn.

Frequency of burning should not be more than once every three years to maintain diversity of upland habitat, and once every two to three years to maintain diversity of wetland habitats.

Time of burning should be just prior to or soon after dormancy break of wildlife preferred species in the spring. A good rule of thumb is to burn when the wildlife preferred species have no more than one inch of new growth.

Limited wildlife habitat in the area should dictate limiting the area to be burned to 1/3 to 1/2 of the total area managed for wildlife habitat.

Criteria to restore and or maintain savannah or oak/hickory communities:

Cruise area prior to burn to document existing vegetation – species and size – to determine if area will respond to a restoration burn and that desirable woody plant regeneration will not be harmed. Show concentrations of honeysuckle, maple, buckthorn, and other undesirable vegetation.

Soils with a tree site index of 80 or more were originally forest. Site indexes <60 are uneconomical to manage for timber. Site indices between 60-80 are questionable. Special care to protect trees from fire damage should be taken if site indexes are above 60 – the prescribed burn prescription should specify fires with very low heat intensity.

Dead wood left to burn can sterilize underlying soil for several years. Avoid brushpiles and downed logs, if possible. If not, burn when conditions allow a cooler fire so chances of igniting the wood are minimized, or move the wood prior to the burn.

Fall and winter burns should not be done if winter cover for wildlife or soil erosion is a concern.

Mortality to oaks, hickory, and ash is less when trees are dormant, and scorch heights are less than 2 feet. Fires with six foot scorch heights or higher will kill even larger (>11" diameter breast height (dbh)) oak trees.

Oak saplings should be allowed to grow to 3-4" dbh before burning.

Restoration of a savannah and/or reduction of aggressive nondesirable plants may require yearly or every other year burns for up to six years to open up the canopy, stimulate oak reproduction, and retard invader species. Once accomplished, burns should be limited to 5 to 15 year intervals to allow oak saplings to reach 3 to 4 inch dbh before burning again. Canopy for savannahs should be kept between 30 to 80 percent.

CONSIDERATIONS

Prescribed Burning **is not** meant to be an annual management practice. Burn **only** to meet a **specific** management objective. (See Purpose)

Adjoining landowners within the anticipated airshed will be notified prior to burning.

Precautions are needed to avoid air contamination from toxic substances or poisonous plants that may exist in an area to be burned. Smoke from burning poison ivy and other poisonous plants can be toxic to individuals and animals.

Burning should be managed with consideration for wildlife needs such as nesting and feeding cover.

Do not burn between April 1 and August 1 in areas likely to be utilized by ground nesting birds. Impacts to fauna of all kinds can be minimized by rotational burning, with no more than one third of an area being burned in one year or season.

Precautions may be needed to avoid impacts to threatened and endangered plant and animal species. Refer to FOTG, Section I, subsection - Threatened and Endangered Species for listings of potential impacts from prescribed burning.

Burn when the vegetation to be burned is dry enough to carry a fire well, but while the soil surface is still damp to the touch. Good soil moisture helps to keep the soil temperature low during the burn.

Late fall and winter burns generally favors the forb component in mixed stands and is useful in improving wildlife habitat. However, fall and winter burns can leave the site vulnerable to erosion for long periods.

Reducing the fuel height to about 1-foot next to the fire line, greatly reduces the intensity of the fire at the fire line. Removing snags and brush piles near firebreak helps prevent fires from escaping or spotting over.

Existing barriers such as lakes, streams, wetlands, roads, and constructed firebreaks can be used as primary or secondary firebreaks and are important to the design and practice layout.

Steep slopes (>20%) and wind speeds less than 5 mph can result in fire movement being directed up slope, being influenced more by slope than wind direction.

ADDITIONAL CONSIDERATIONS for Smoke Management Planning:

Avoidance, Dilution, and Emissions Reduction are ways to manage smoke from prescribed fires.

Avoidance: planning burns when conditions that make intrusions of smoke into sensitive areas

unlikely can often prevent pollution. Stagnant high-pressure systems usually cause problems with smoke dispersion and burning under those conditions should be avoided when smoke management is critical. Most fires have an active burning period and a residual period (see Residual Smoke). Wind directions during both periods must be carefully considered.

Dilution: Smoke concentrations can be reduced by diluting smoke through a greater volume of air, either by scheduling burns during good dispersion conditions or burning at slower rates (burning smaller or narrower strips or smaller areas). Burning at slower rates may mean burning later into the evening. Usually, a morning burn has improving rates of ventilation; an evening burn generally faces deteriorating ventilation conditions.

Emission Reduction: Backing fires more completely consume the fuel load during the active burning period which allows more smoke to be entrained in the convection column; minimizing the inefficient smolder phase of a prescribed fire. Scheduling fires when duff and larger fuels are too wet to burn also reduces emissions.

Atmospheric stability is the degree to which vertical motion in the atmosphere is enhanced or suppressed. An unstable atmosphere enhances vertical motion, hence increases mixing and the dispersion of smoke. A stable atmosphere suppresses vertical motion, thereby limiting the dispersion of smoke.

When smoke management is critical, burn when conditions are good for rapid dispersion of smoke. The atmosphere should be somewhat unstable so that the smoke will rise and dissipate, but not so unstable as to be problematic in controlling the burn.

Residual smoke associated with smoldering larger slash or brush fuels can cause serious visibility problems, especially at night, if not carefully planned.

Heavy, carbon-laden smoke has caused dangerous discharges from overhead, electrical transmission lines.

PLANS AND SPECIFICATIONS

A Prescribed Burn Plan will be developed, using IL-JS-338, which will contain the specifications for conducting the prescribed burn.

Prescribed Burning Specifications must adhere to all applicable NRCS policies in the General Manual and the National Range and Pasture Handbook, as well as all applicable state and local laws, ordinances, and regulations. Landowner or land operator prior to conducting the prescribed burn will obtain necessary approval, permits, and variances.

The Prescribed Burn Plan is specific to the area and for the burning season planned. If the plan is to be used for a subsequent burn season the plan will be revised to address the current situation.

Conduct a test burn on the down wind side of the planned burn area and within the protection of an established firebreak. Use the test burn to confirm that the fire will burn as predicted, the burn will achieve the planned objective and the smoke can be managed as planned. Defer the burn if the test burn is not satisfactory or if prolonged drought has caused high fire danger levels. Burn only within the prescription set forth in the Prescribed Burn Plan.

Deferring a burn entails notifying all parties on the Prescribed Burn Plan, IL-JS-338, of the cancellation.

OPERATION AND MAINTENANCE

To achieve benefits of the prescribed burn, other practices in a Conservation Management System need to be carried out as planned.

Under poor growing conditions, low plant vigor, and/or downward trend, range or pasture will

require one full growing season of deferment from grazing, or incorporated into a prescribed grazing system.

Under good growing conditions and good plant vigor, grazing can begin as soon as cool season grasses attain 6 to 8 inches of new growth and warm season grasses attain 10 to 12 inches.

PERFORMANCE CRITERIA

This practice will be completed when the prescribed burn has been carried out according to the design specifications and the desired resource management objectives have been achieved or identified resource problems have been solved.

REFERENCES:

Open Burning, IL. Admin.Code, Title 35, subtitle B, Chapt. I, Subchapter. I, Part 237. See Subchapter. I, Open Burning, at [www.ipcb.state.il.us.title35/35conten.htm#b](http://www.ipcb.state.il.us/title35/35conten.htm#b)

Packard, Stephen and Cornelia F. Mutel. 1997. The Tallgrass Restoration Handbook, for Prairies, Savannas, and Woodlands. Island Press, Washington, DC, 463 pp.

McClain, William E. 1997. Prairie Establishment and Landscaping. Tech. Pub. #2, IL-DNR, Div. of Nat. Herit., Springfield, IL. 62 pp.

Higgins, K. F., Kruse, A. D., and Piehl, J. L. 1989. Prescribed Burning Guidelines in the Northern Great Plains. U.S. Fish and Wildlife Service Publication EC 760. 36 pp.

TABLE 1: PRESCRIBED BURNING - SOIL LIMITATIONS AND RESTRICTIONS

SOIL PROPERTY	LIMITATIONS			RESTRICTIVE FEATURE
	SIGHT	MODERATE	SEVERE	
1. SLOPE (PERCENT)	<35	35 TO 55	> 55	SLOPE
2. SOIL TEXTURE (SURFACE 10 INCHES) <u>1/</u>	CL, SICL, LVFS, SI, SIL, L FSL, SL, VFSL	SC, SIC, C, LS, LFS, LCOS	S, FS, COS PEAT, MUCK	TOO CLAYEY TOO SANDY ORGANIC
3. FINEST TEXTURE	---	---	SAND (UNLESS SPODIC)	TOO SANDY
4. DRAINAGE CLASS	---	SE	E	DROUGHTY
5. EFFECTIVE ROOTING DEPTH	> 36	12 TO 36	< 12	RESTRICTIVE LAYER
6. THICKNESS OF "O" HORIZON (INCHES)	> 1	1	< 1	THIN LAYER

1/ If a spodic horizon exists in sandy soils, rate one class higher (i.e. LESS RESTRICTIVE).

CL - clay loam
SICL - silty clay
LVFS - loamy very fine sand
SI - silty
SIL - silty loam
L - loamy

FSL - fine sandy loam
VFSL - very fine sandy loam
SL - sandy loam
SC - sandy clay
SIC - silty clay
C - clay
LS - loamy sand

LFS - loamy fine sand
LCOS - loamy coarse sand
S - sand
FS - fine sand
COS - coarse sand
SE - somewhat excessive
E - excessive